CLAIMS

1. Medical product the surface of which comprises at least partially a polymer layer, wherein the polymer layer comprises substances, wherein the substances participating in the polymerization reaction contain a linear or branched and a substituted or non substituted alkyl moiety with at least one multiple bond.

2. Medical product according to claim 1, wherein the alkyl moiety containing at least one multiple bond has 7 to 50 carbon atoms.

3. Medical product according to claim 1 or 2, wherein the polymer layer consists of at least 25% by weight of the substances participating in the polymerization reaction, which comprise at least an alkyl moiety containing one multiple bond.

4. Medical product according to one of the aforementioned claims, wherein the substances containing at least one alkyl moiety with at least one multiple bond are covalently linked with each other via polymerization of the at least one multiple bond.

5. Medical product according to one of the aforementioned claims, wherein the substances containing at least one alkyl moiety with at least one multiple bond are capable of polymerization and preferred of auto-polymerization.

6. Medical product according to one of the aforementioned claims, wherein the substances containing at least one alkyl moiety with at least one multiple bond are chosen from the group comprising fatty acids, fatty acid esters, fatty acid derivatives, ethers, diethers, tetraethers, lipids, oils, fats, glycerides, tri-glycerides, glycol esters, glycerin esters as well as mixtures of the aforementioned substances.

7. Medical product according to claim 6, wherein in the case of the lipids mono- or poly-unsaturated fatty acids and/or mixtures of these unsaturated fatty acids in the form of their triglycerides and/or in non glycerin bound, free form are concerned.

8. Medical product according to claim 6 or 7, characterized in that the unsaturated fatty acids are chosen from the group comprising oleic acid, eicosapentaenoic acid, timnodonic acid, docosahexaenoic acid, arachidonic acid, linoleic acid, α-

linolenic acid, γ-linolenic acid as well as mixtures of the aforementioned fatty acids.

9. Medical product according to claim 6, characterized in that in the case of the oils linseed oil, hempseed oil, corn oil, walnut oil, rape oil, soy bean oil, sun flower oil, poppy-seed oil, safflower oil, wheat germ oil, grape-seed oil, evening primrose oil, borage oil, black cumin oil, algae oil, fish oil, cod-liver oil and/or mixtures of the aforementioned substances are concerned.

10. Medical product according to claim 9, characterized in that the oils and the mixtures of the oils, respectively, contain an amount of at least 40% by weight of unsaturated fatty acids.

11. Medical product according to one of the aforementioned claims, characterized in that the substances not participating in the polymerization reaction comprise saturated fatty acids, saturated fatty acid esters, saturated fatty acid derivatives, saturated ethers, saturated lipids, lipoids, saturated fats and oils, saturated glycerides, saturated triglycerides, saturated glycol esters, saturated glycerin esters, waxes, biostable or biodegradable polymers or mixtures of the aforementioned substances.

12. Medical product according to claim 11, characterized in that in the case of the saturated fatty acids the long-chain fatty acids beyond a chain length of 12 carbon atoms as well as mixtures thereof and/or natural lipoids such as palm kernel fat, coconut fat as well as their mixtures are concerned.

13. Medical product according to claim 11, characterized in that in the case of the waxes beeswax, camauba wax, candelilla wax and/or mixtures thereof are concerned.

14. Medical product according to claim 11, characterized in that the biostable polymers are chosen from the group comprising polyacrylic acid and polyacrylates such as polymethylmethacrylate, polybutylmethacrylate, polyacrylamide, polyacrylonitriles, polyamides, polyetheramides, polyethylenamine, polyimides, polycarbonates, polycarbourethanes, polyvinylketones, polyvinylhalogenides, polyvinylidenhalogenides, polyvinylethers, polyvinylaromates, polyvinylesters, polyvinylpyrollidones, polyoxymethylenes, polyethylene, polypropylene, polytetrafluoroethylene, polyurethanes, polyolefine elastomeres, polyisobutylenes, EPDM gums,

fluorosilicones, carboxymethylchitosanes, polyethyleneterephthalate, polyvalerates, carboxymethylcellulose, cellulose, rayon, rayontriacetates, cellulosenitrates, celluloseacetates, hydroxyethylcellulose, cellulosebutyrates, celluloseacetatebutyrates, ethylvinylacetate copolymers, polysulphones, epoxy resins, ABS resins, EPDM gums, silicones such as polysiloxanes, polyvinylhalogenes and copolymers, celluloseethers, cellulosetriacetates, chitosanes and copolymers and/or mixtures of these substances.

15. Medical product according to claim 11, characterized in that the biodegradable polymers are chosen from the group comprising polyvalerolactones, poly-ε-decalactones, polylactides, polyglycolides, copolymers of the polylactides and polyglycolides, poly-ε-caprolactone, polyhydroxybutanoic acid, polyhydroxybutyrates, polyhydroxyvalerates, polyhydroxybutyrate-co-valerates, poly(1,4-dioxane-2,3-diones), poly(1,3-dioxane-2-one), poly-para-dioxanones, polyanhydrides such as polymaleic anhydrides, polyhydroxymethacrylates, fibrin, polycyanoacrylates, polycaprolactonedimethylacrylates, poly-b-maleic acid, polycaprolactonebutyl-acrylates, multiblock polymers such as for example from oligocaprolactonedioles and oligodioxanonedioles, polyetherester multiblock polymers such as for example PEG and poly(butyleneterephtalates), polypivotolactones, polyglycolic acid trimethyl-carbonates, polycaprolactone-glycolides, poly(g-ethylglutamate), poly(DTH-iminocarbonate), poly(DTE-co-DT-carbonate), poly(bisphenol-A-iminocarbonate), polyorthoesters, polyglycolic acid trimethyl-carbonates, polytrimethylcarbonates, polyiminocarbonates, poly(N-vinyl)-pyrrolidone, polyvinylalcoholes, polyesteramides, glycolated polyesters, polyphosphoesters, polyphosphazenes, poly[p-carboxyphenoxy)propane], polyhydroxypentanoic acid, polyanhydrides, polyethyleneoxide-propyleneoxide, soft polyurethanes, polyurethanes with amino acid moieties in the backbone, polyetheresters such as polyethyleneoxide, polyalkeneoxalates, polyorthoesters as well as their copolymers, carrageenans, fibrinogen, starch, collagen, protein based polymers, polyamino acids, synthetic polyamino acids, zein, modified zein, polyhydroxyalkanoates, pectic acid, actinic acid, modified and non modified fibrin and casein, carboxymethylsulphate, albumin, moreover hyaluronic acid, heparansulphate, heparin, chondroitinesulphate, dextran, b-cyclodextrines and copolymers with PEG and polypropyleneglycol, gummi arabicum, guar, gelatin, collagen, collagen-N-Hydroxysuccinimide, modifications and copolymers and/or mixtures of the aforementioned substances.

16. Medical product according to one of the aforementioned claims, characterized in that the substances not participating in the polymerization reaction comprise

antiproliferative, antiinflammatoric and/or antithrombotic active agents chosen from the group comprising sirolimus (rapamycin), everolimus, pimecrolimus, somatostatin, tacrolimus, roxithromycin, dunaimycin, ascomycin, bafilomycin, erythromycin, midecamycin, josamycin, concanamycin, clarithromycin, troleandomycin, folimycin, cerivastatin, simvastatin, lovastatin, fluvastatin, rosuvastatin, atorvastatin, pravastatin, pitavastatin, vinblastine, vincristine, vindesine, vinorelbine, etoposide, teniposide, nimustine, carmustine, lomustine, cyclophosphamide, 4-hydroxycyclophosphamide, estramustine, melphalan, ifosfamide, trofosfamide, chlorambucil, bendamustine, dacarbazine, busulfan, procarbazine, treosulfan, temozolomide, thiotepa, daunorubicin, doxorubicin, aclarubicin, epirubicin, mitoxantrone, idarubicin, bleomycin, mitomycin, dactinomycin, methotrexate, fludarabine, fludarabine-5'-dihydrogenphosphate, cladribine, mercaptopurine, thioguanine, cytarabine, fluorouracil, gemcitabine, capecitabine, docetaxel, carboplatin, cisplatin, oxaliplatin, amsacrine, irinotecan, topotecan, hydroxycarbamide, miltefosine, pentostatin, aldesleukin, tretinoin, asparaginase, pegaspargase, anastrozole, exemestane, letrozole, formestane, aminoglutethimide, adriamycin, azithromycin, spiramycin, cepharantin, smc proliferation inhibitor-2w, epothilone A and B, mitoxantrone, azathioprine, mycophenolatmofetil, c-myc-antisense, b-myc-antisense, betulinic acid, camptothecin, PI-88 (sulfated oligosaccharide), melanocyte stimulating hormone (α-MSH), activated protein C, IL-1β inhibitor, thymosine α-1, fumaric acid and its esters, calcipotriol, tacalcitol, lapachol, β-lapachone, podophyllotoxin, betulin, podophyllic acid 2-ethylhydrazide, molgramostim (rhuGM-CSF), peginterferon α-2b, lenograstim (r-HuG-CSF), filgrastim, macrogol, dacarbazine, basiliximab, daclizumab, selectin (cytokine antagonist), CETP inhibitor, cadherines, cytokinin inhibitors, COX-2 inhibitor, NFkB, angiopeptin, ciprofloxacin, camptothecin, fluroblastin, monoclonal antibodies, which inhibit the muscle cell proliferation, bFGF antagonists, probucol, prostaglandins, 1,11-dimethoxycanthin-6-one, 1-hydroxy-11-methoxycanthin-6-one, scopoletin, colchicine, NO donors such as pentaerythritol tetranitrate and syndnoeimines, S-nitrosoderivatives, tamoxifen, staurosporine, β-estradiol, α-estradiol, estriol, estrone, ethinylestradiol, fosfestrol, medroxyprogesterone, estradiol cypionates, estradiol benzoates, tranilast, kamebakaurin and other terpenoids, which are applied in the therapy of cancer, verapamil, tyrosine kinase inhibitors (tyrphostines), cyclosporine A, paclitaxel and derivatives thereof such as 6-α-hydroxy-paclitaxel, baccatin, taxotere, synthetically produced as well as from native sources obtained macrocyclic oligomers of carbon suboxide (MCS) and derivatives thereof, mofebutazone, acemetacin, diclofenac, lonazolac, dapsone, o-carbamoylphenoxyacetic acid, lidocaine, ketoprofen, mefenamic acid,

piroxicam, meloxicam, chloroquine phosphate, penicillamine, tumstatin, avastin, D-24851, SC-58125, hydroxychloroquine, auranofin, sodium aurothiomalate, oxaceprol, celecoxib, β-sitosterin, ademetionine, myrtecaine, polidocanol, nonivamide, levomenthol, benzocaine, aescin, ellipticine, D-24851 (Calbiochem), colcemid, cytochalasin A-E, indanocine, nocodazole, S 100 protein, bacitracin, vitronectin receptor antagonists, azelastine, guanidyl cyclase stimulator, tissue inhibitor of metal proteinase-1 and –2, free nucleic acids, nucleic acids incorporated into virus transmitters, DNA and RNA fragments, plasminogen activator inhibitor-1, plasminogen activator inhibitor-2, antisense oligonucleotides, VEGF inhibitors, IGF-1; active agents from the group of the antibiotics such as cefadroxil, cefazolin, cefaclor, cefotaxim, tobramycin, gentamycin, penicillins such as dicloxacillin, oxacillin, sulfonamides, metronidazol, antithrombotics such as argatroban, aspirin, abciximab, synthetic antithrombin, bivalirudin, coumadin, enoxaparin, desulphated and N-reacetylated heparin, tissue plasminogen activator, GpIIb/IIIa platelet membrane receptor, factor X_a inhibitor antibodies, heparin, hirudin, r-hirudin, PPACK, protamin, sodium salt of 2-methylthiazolidine-2,4-dicarboxylic acid, prourokinase, streptokinase, warfarin, urokinase, vasodilators such as dipyramidole, trapidil, nitroprussides, PDGF antagonists such as triazolopyrimidine and seramin, ACE inhibitors such as captopril, cilazapril, lisinopril, enalapril, losartan, thio-protease inhibitors, prostacyclin, vapiprost, α, β and γ interferon, histamine antagonists, serotonin blockers, apoptosis inhibitors, apoptosis regulators such as p65, NF-kB or Bcl-xL antisense oligonucleotides, halofuginone, nifedipine, tocopherol, vitamin B1, B2, B6 and B12, folic acid, tranilast, molsidomine, tea polyphenols, epicatechin gallate, epigallocatechin gallate, Boswellinic acids and derivatives thereof, leflunomide, anakinra, etanercept, sulfasalazine, etoposide, dicloxacillin, tetracycline, triamcinolone, mutamycin, procainamid, D24851, SC-58125, retinoic acid, quinidine, disopyramide, flecainide, propafenone, sotalol, amidorone, natural and synthetically produced steroids such as bryophyllin A, inotodiol, maquiroside A, ghalakinoside, mansonine, strebloside, hydrocortisone, betamethasone, dexamethasone, non-steroidal substances (NSAIDS) such as fenoprofen, ibuprofen, indomethacin, naproxen, phenylbutazone and other antiviral agents such as acyclovir, ganciclovir and zidovudine, antimycotics such as clotrimazole, flucytosine, griseofulvin, ketoconazole, miconazole, nystatin, terbinafine, antiprozoal agents such as chloroquine, mefloquine, quinine, moreover natural terpenoids such as hippocaesculin, barringtogenol-C21-angelate, 14-dehydroagrostistachin, agroskerin, agrostistachin, 17-hydroxyagrostistachin, ovatodiolids, 4,7-oxycycloanisomelic acid, baccharinoids

B1, B2, B3 and B7, tubeimoside, bruceanol A, B and C, bruceantinoside C, yadanziosides N and P, isodeoxyelephantopin, tomenphantopin A and B, coronarin A, B, C and D, ursolic acid, hyptatic acid A, zeorin, iso-iridogermanal, maytenfoliol, effusantin A, excisanin A and B, longikaurin B, sculponeatin C, kamebaunin, leukamenin A and B, 13,18-dehydro-6-α-senecioyloxychaparrin, taxamairin A and B, regenilol, triptolide, moreover cymarin, apocymarin, aristolochic acid, anopterin, hydroxyanopterin, anemonin, protoanemonin, berberine, cheliburin chloride, cictoxin, sinococuline, bombrestatin A and B, cudraisoflavone A, curcumin, dihydronitidine, nitidine chloride, 12-β-hydroxypregnadiene-3,20-dione, bilobol, ginkgol, ginkgolic acid, helenalin, indicine, indicine-N-oxide, lasiocarpine, inotodiol, glycoside 1a, podophyllotoxin, justicidin A and B, larreatin, malloterin, mallotochromanol, isobutyrylmallotochromanol, maquiroside A, marchantin A, maytansine, lycoridicin, margetine, pancratistatin, liriodenine, oxoushinsunine, aristolactam-AII, bisparthenolidine, periplocoside A, ghalakinoside, ursolic acid, deoxypsorospermin, psychorubin, ricin A, sanguinarine, manwu wheat acid, methylsorbifolin, sphatheliachromen, stizophyllin, mansonine, strebloside, akagerine, dihydrousambarensine, hydroxyusambarine, strychnopentamine, strychnophylline, usambarine, usambarensine, berberine, liriodenine, oxoushinsunine, daphnoretin, lariciresinol, methoxylariciresinol, syringaresinol, umbelliferon, afromoson, acetylvismione B, desacetylvismione A, vismione A and B and sulfur containing amino acids such as cystine as well as salts and/or mixtures of the aforementioned active agents.

17. Medical product according to claim 16, characterized in that the active agent is chosen from the group comprising tacrolimus, pimecrolimus, PI-88, paclitaxel and its derivatives, trapidil, α- and ß-estradiol, sodium salt of 2-methylthiazolidine-2,4-dicarboxylic acid, macrocyclic carbon suboxide (MCS) and its derivatives, sirolimus, fumaric acid and its esters, activated protein C, interleukin-1ß inhibitors and melanocyte-stimulating hormone (α-MSH), cystine, ellipticine, bohemine, indanocine, colcemid and derivatives thereof, methionine as well as salts and/or mixtures of the aforementioned active agents.

18. Medical product according to one of the aforementioned claims, wherein at least one antiproliferative, antiinflammatoric and/or antithrombotic active agent according to claim 16 is bound covalently and/or adhesively under and/or in and/or on the polymer layer.

19. Medical product according to claims 16 - 18, characterized in that the antiproliferative, antiinflammatoric and/or antithrombotic active agent according to claim 16 is contained in a pharmaceutically active concentration of 0.001 to 10 mg per cm^2 surface of the medical product.

20. Medical product according to one of the aforementioned claims, wherein the substances for the polymer layer contain a polymerization catalyst in a biocompatible concentration.

21. Method for the biocompatible coating of medical products comprising the steps:
    a) providing a surface of a medical product,
    and
    b) deposition of the substances for the polymer layer,
    and
    c) polymerization of the substances containing at least one alkyl moiety with at least one multiple bond by means of exposure to heat, light and/or aerial oxygen and/or by means of one a catalyst contained in a biocompatible concentration.

22. Method for the biocompatible coating of medical products comprising the steps:
    a) providing a surface of a medical product,
    and
    a') deposition of layer of an antiproliferative, antiinflammatoric and/or antithrombotic active agent or active agent mixture according to claim 16,
    and
    b) deposition of the substances for the polymer layer,
    and
    c) polymerization of the substances containing at least one alkyl moiety with at least one multiple bond by means of exposure to heat, light and/or aerial oxygen and/or by means of one a catalyst contained in a biocompatible concentration.

23. Method according to claims 21 or 22 further comprising the step d):
    d) deposition and/or incorporation of a layer of an antiproliferative, antiinflammatoric and/or antithrombotic active agent or active agent mixture according to claim 16 on the polymer layer.

24. Method according to one of the claims 21 - 23 further comprising the step e):

e) deposition of at least another polymerized layer of the polymers according to claim 14 or 15 on the subjacent layer or of another polymer layer according to the steps b) and c).

25. Method according to one of the claims 21 – 24, characterized in that the active agents according to claim 16 and the substances for the polymer layer are deposited by the dipping and/or spraying method.

26. Method according to one of the claims 21 – 25, characterized in that the antiproliferative, antiinflammatoric and/or antithrombotic active agent according to claim 16 is bound covalently and/or adhesively in and/or to the respective layer.

27. Method according to one of the claims 21 – 26, characterized in that the antiproliferative, antiinflammatoric and/or antithrombotic active agent or the active agent combination according to claim 16 is present in a pharmaceutically active concentration of 0.001 to 10 mg per cm^2 surface of the medical product.

28. Medical product obtainable in accordance with one of the methods according to one of the claims 21 – 27.

29. Medical product according to one of the claims 1 – 20 or 28, characterized in, that in the case of the medical product a stent is concerned.

30. Stent according to claim 29, wherein the stent is suitable to prevent or to reduce restenosis.

31. Stent according to claim 29 or 30, wherein the stent is suitable to continuously release at least one antiproliferative, antiinflammatoric, antiangiogenic and/or antithrombotic active agent according to claim 16.